

TITLE. ADJUSTABLE HOCKEY SKATE BLADE SYSTEM

FIELD OF THE INVENTION

5 The present invention provides a system which allows adjustment of the position of the hockey blade holder relative to a hockey skate boot to accommodate the physical requirements of the specific skater.

BACKGROUND OF THE INVENTION

10 Hockey skate design has been dominated by a skate system where a skate boot has a molded blade holder attached thereto with the holder extending downwardly from the skate. A replaceable skate blade is received in a slot on the bottom surface of the holder. The TUUK™ blade holder, manufactured by Canstar Sports Inc., is one example of this type of system. However, similar systems are offered by Easton™, CCM™ and others. The molded plastic blade holder includes a front hollow pedestal portion and a rear hollow pedestal which extend downwardly from the sole of the boot. Each pedestal includes a securing arrangement which cooperates with the skate boot. The blade holder is secured to the sole of the boot at a number of peripheral points in an outwardly extending flange of each pedestal. Typically the blade holder is secured by rivets which pass through ports in the flange of each of the pedestals or by a fastener having a diameter corresponding to the hole diameter provided in the flange. The outward securing of the pedestals near the periphery of the sole of the skate boot provides a mechanical advantage in distributing the forces which are transmitted through the skate boot to the skate blade. These forces can be quite large and

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have a variety of different directions due to the speed and sudden changes in direction common in hockey, due to its unpredictable nature. In addition to the high forces the skate system must endure due to the skating action, 5 there are also forces in hockey as a result of collisions with the puck the boards and/or players or other player's equipment.

The downward tapering of the pedestals from the 10 sole of the boot to the skate blade helps to redirect the puck and a gap is there to give stability to each of the pedestals.

Many hockey skates are sold as a complete system 15 with the holder and blade already attached to the hockey boot at the time of manufacture. In more expensive hockey skates the users can select the particular hockey skate boot and then match it with a desired holder and blade. Hockey skate holders are typically secured to the 20 skate boot in a centered and aligned orientation. Forward and rearward balance on the skates can be controlled by custom blade sharpening to changing the shape of the lower surface of the blade which contacts the ice. Some players prefer a highly curved surface 25 which is desirable for rapid turning whereas others are more interested in speed and balance and have a large flat portion between a front curved portion and a rear curved portion.

30 This type of adjustment has been found by the inventor to be inadequate and does not address the widely ranging physical attributes of different hockey players. As can be appreciated hockey players can be pigeon toed, duck footed, knock kneed or bowlegged. Some of these 35 conditions are caused or exaggerated by having flat feet or fallen arches.

The inventor has found considerable performance improvement is achieved by providing a system which allows the individual hockey player to tailor the particular securement of the blade system to a hockey boot to meet his particular needs. These adjustments can include offsets either side of a center line of the hockey skate and it can also include toe in or toe out adjustments as well heel in and heel out adjustments. Some approximate adjustments of the position of the blade holder can be carried out in a pro-shop however, final adjustment typically requires the actual use by the player.

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SUMMARY OF THE PRESENT INVENTION

A hockey skate according to the present invention comprises a boot, a blade holder, a blade received in the blade holder and an adjustable arrangement for altering the attachment position of the blade holder to the boot. The adjustable arrangement engages outwardly extending flanges of the boot holder in one of a plurality of positions where each of these positions has a different orientation of the blade relative to a centerline of the boot.

According to an aspect of the invention the adjustable arrangement includes a series of releasable fasteners passing through ports in the blade holder and releasably engage the boot to secure the holder to the boot.

In yet a further aspect of the invention the flanges of the skate holder include a toe flange having a plurality of elongate slots in the toe flange to accommodate a series of toe in and toe out positions of

the skate blade.

In yet a further aspect of the invention the flanges of the blade holder include a heel flange having
5 a plurality of elongate slots in the heel flange to accommodate a series of heel in and heel out positions.

In yet a further aspect of the invention each of the flanges of the blade holder has at least four
10 elongated slots.

In yet a further aspect of the invention the adjustable arrangement includes a clamping system for each flange to engage the blade holder in any of said
15 positions.

In yet a further aspect of the invention each clamping arrangement includes a first component secured to the holder with the first component adjustably
20 received in a second component secured to said boot.

In yet a further aspect of the invention the first component is a plate received in a slot of the second component along an edge portion of the first component
25 and to the exterior of the blade holder and accessible on a lower portion of the boot.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Preferred embodiments of the invention are shown in the drawings wherein;

Figure 1 is a perspective view of the blade holder with a series of elongated securing slots;
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Figure 2 is a side view of an adjustable plate

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system for the blade holder;

Figure 3 is a bottom view of the blade holder of Figure 2 showing the securing plates associated with the front and rear pedestals;

Figure 4 is a bottom view showing adjustment of the plate system; and

Figure 5 is a perspective view of the adjustable plate system secured to the sole of a hockey skate boot.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The hockey skate 2 has a boot 4 with a stepped lower surface 6. The stepped lower surface 6 forms the sole of the boot and has a series of ports 8 for receiving releasable fasteners 10. The fasteners 10 can be two piece fasteners which extend through the sole of the boot or can be built into the boot. Thus, any suitable fastener can be used. The blade assembly 11 includes a blade holder 12 and a blade 14. Securement of the blade 14 to the holder can use any of the conventional arrangements or other securing system.

The blade holder 12 includes a front pedestal 20 secured under the toe of the boot and a rear pedestal 22 secured under the heel of the boot. The front pedestal and rear pedestal are joined by a connecting portion 24 which has the downwardly opening blade receiving slot 26 which partially receives the blade 14 along the length thereof.

The front pedestal 20 includes an outwardly extending securing flange 30 and the rear pedestal 22 includes an outwardly extending securing flange 32.

Relative to the conventional blade holder the flanges 30 and 32 are somewhat larger to accommodate the front elongate securing slots 34 either side of the holder and rear elongate securing slots 36 either side of the holder. With the larger flanges, the shape of the pedestals has been altered to include concaved recesses 40 in the front pedestal and concave recesses 42 in the rear pedestal. It is also possible to reduce the width of the pedestals and increase the flange area to accommodate the additional slot area or to make the pedestals closer to a post system.

With the system as shown in Figure 1 the modified blade holder 12 can be secured to the sole of the boot in a plurality of positions. It is held in any of these positions by means of releasable fasteners 10 which engage the elongate slots and secure the holder to the boot. If adjustment is necessary the releasable fasteners may be loosened and the blade holder repositioned relative to the sole of the boot. To assist in this realignment the flange 30 includes front and rear aligning marking 50 and the rear flange 32 includes aligning mark 52. The sole of the boot includes a number of aligning grooves 56 adjacent the toe portion and aligning grooves 58 in the heel portion to allow determination of the orientation of the blade 14 relative to the centerline of the boot or any reference point on the boot. Aligning marks can also be provided at the toe of the boot, if desired. The elongate slots are about 3/8 of an inch in length.

With the system as shown in Figure 1 the modified holder 12 can be releasably secured to the sole of the boot 4 and the user may provide adjustments of the position of the holder relative to the boot. In this case the various releasable fasteners are loosened and

the skate holder 12 adjusted to a new orientation. The system allows for both toe in and toe out adjustment as well as heel in and heel out adjustments. The holder is also moveable relative to the centerline of the boot.

- 5 All of these adjustments in combination, allow a player to find the position that provides him with the most comfort and performance.

10 Once the desired position is known the holder can be permanently secured to the boot using rivets, screws, or other fasteners. Additional tight fitting securing holes in the securing flanges can be used or a conventional holder can then be mounted on the boot in the particular optimum position. The conventional holder
15 can be modified to have the same marking points or to allow accurate placement. The actual blade holders are relatively inexpensive and it may be desirable to use the conventional style once the best position or satisfactory position has been determined.

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The system of Figure 1 allows for continuous adjustment within the slots but an incremented system can be used if desired. The system can accommodate forward and back adjustment if desired.

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The arrangement shown in Figures 2 through 5 operates in a modified manner. In this case, the hockey skate 102 includes a boot 104 which receives or has integral with the base of the boot, an adjustable
30 clamping arrangement 120. The clamping arrangement includes a heel mounting arrangement 122 which is fixed to the sole of the boot. This mounting arrangement includes a front clamping slot 124 and a rear clamping slot 126. The clamping slots provide a tight fit with
35 the securing plates 140 and 142 but allow sliding movement along the slots. The modified holder 112 is

attached to securing plates 140 and 142 to be generally fixed therewith. At the front of the skate 102 is a mounting plate 132 having a rear clamping slot 136. This member will receive the plate 142 such that the plate is
5 slidable in the slots 136. Screws 150 can cause the slots 124, 126 and 136 to engage and fixedly retain members 140 and 142.

The modified holder 112 can also include a
10 threaded worm drive associated with one or each pedestal. The threaded worm member cooperates with a threaded port fixed to the sole and thereby allows adjustment of the position of the holder relative to the rear member 122. The threaded port could be a rack gear attached to the
15 sole. The gear adjustment can provide faster on ice adjustment.

With this system, the clamping slots can be released and the user can adjust the position of the heel
20 relative to the centerline of the boot. In addition, the front pedestal of the holder can be adjusted relative to the toe of the boot.

In some cases rigid securement is not necessary.
25 For example, a user can use several fasteners to secure the holder in place and test the skate in a cautious manner. Adjustments can quickly be made. Once the general desired position is known all fasteners can be used to test the skate under demanding conditions.

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Each of the systems have a series of guide markings that allow the user to determine the position that the holder has been moved to. This can be quite important as adjustment of the front position typically
35 causes some movement of the rear position. To find the optimum position a player may wish to keep notes on the

different settings and the results at these settings.

The system of Figures 2 through 5 are designed to allow more rapid on ice adjustment of the position of the holder relative to the boot. Once it is generally known what positions are believed to be optimum the system can allow further fastening to test the skate under more demanding conditions. This system is designed to be used as part of the process for finding the optimum position or satisfactory position. Once this position is known it can be marked on the boot or the position can be determined by the various guide markings and then a conventional holder can be secured in that position to the sole of the boot with the skate being worn by the user. Each worm member is rotatably mounted with the holder and accessible at one side of the holder. The rotatable position of the worm member determines the position of the holder relative to the sole of the boot. The worm member 200 shown in Figure 5 passes through a threaded port 304 in the downwardly extending post 202 attached to the sole of the boot. A worm drive member 200 is provided in each pedestal and posts 202 are attached adjacent each pedestal securing the blade holder sufficiently to allow testing and fast adjustment. The thread on the worm drive can be significantly aggressive to act as its own lock against further adjustment on a temporary basis. Preferably, the worm drives are adjustable from opposite sides of the boot holder and the threads are opposed to provide some binding or tensions therebetween. It is also possible to use a removable lock pin or other locking member for fixing the worm drive for skate trial basis. Once the final position is known, the holder is preferably fixed in a conventional manner or a conventional holder is substituted and secured in the desired position. The post 202 is only visible in Figure 5 as the holder has been partially cut

away.

Preferably, the worm drives are adjustable from opposite sides of the boot holder and the threads are
5 opposed to provide some binding or tensioning therebetween.

It has been found that proper positioning of the blade holder can dramatically affect the ability of a
10 hockey player to accelerate, turn in both directions and effectively perform at a higher level. It can also be appreciated that the player can select or effectively trade-off between positions that may allow more effective turning versus other positions which may allow for faster
15 acceleration or ultimate speed. Most players will seek a compromise between these two characteristics. This system has been found to greatly improve the performance of hockey players whose particular physical attributes are significantly different from the norm. In addition,
20 it allows player whose attributes are closer to the norm to fine tune the position to optimize or improve their performance.

Proper position of the holder to the boot sole can
25 allow a player to skate more easily with less muscle effect to maintain balance and allow other muscles to be more relaxed. Thus, adjustment of the position of the holder allows muscles to be more efficient due to better alignment.

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This system can also be used with different shims or modified holders to accommodate height adjustment or angle adjustment across the boot sole.

Although various preferred embodiments of the present invention have been described in detail, it will be appreciated by those skilled in the art that
5 variations may be made without departing from the spirit of the invention or the scope of the appended claims.